

(19)日本国特許庁 (JP)

## (12) 公開特許公報 (A)

(11)特許出願公開番号

特開平8-314318

(43)公開日 平成8年(1996)11月29日

(51) Int.Cl.  
G 0 3 G 15/20  
B 6 5 H 29/54

識別記号 106  
府内整理番号

F I  
G 0 3 G 15/20  
B 6 5 H 29/54

技術表示箇所

106

(21)出願番号 特願平7-121047

(22)出願日 平成7年(1995)5月19日

(71)出願人 591044164

株式会社沖データ

東京都港区芝浦四丁目11番地22号

(72)発明者 板谷 隆

東京都港区芝浦4丁目11番地22号 株式会  
社沖データ内

(72)発明者 矢島 弘之

東京都港区芝浦4丁目11番地22号 株式会  
社沖データ内

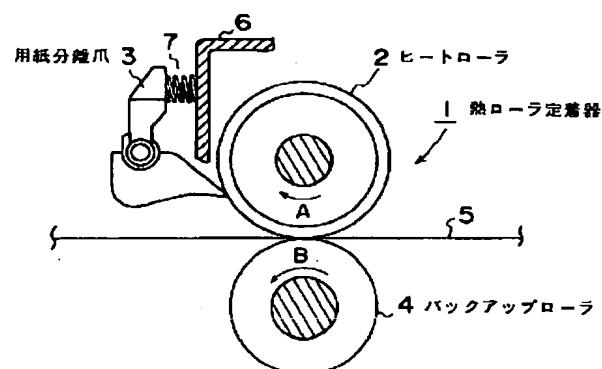
(74)代理人 弁理士 大西 健治

(54)【発明の名称】熱ローラ定着器

## (57)【要約】

【目的】微小なオフセットトナーが用紙分離爪とヒートローラ面との当接部に溜まらないようにして、印刷用紙がオフセットトナーにより汚されることから防止する熱ローラ定着器を提供する。

【構成】ヒートローラのローラ面に接触する用紙分離爪の接触幅を1mm未満にしてヒートローラのローラ面に付着した微小なオフセットトナーが用紙分離爪とヒートローラ面との当接部で大きな固まりにならないようにする。



熱ローラ定着装置の概略構成を示す側面図

## 【特許請求の範囲】

【請求項1】 ヒートローラのローラ面に爪部を接触させた用紙分離爪を有し、ヒートローラとバックアップローラとの圧接部で未定着トナー画像を印刷用紙の紙面に加熱圧着し、ヒートローラ面に付着した印刷用紙を用紙分離爪でヒートローラ面から分離させる熱ローラ定着器において、

上記用紙分離爪はヒートローラのローラ面との接触幅を1mm未満にしてヒートローラのローラ面に付着した微小なオフセットトナーが用紙分離爪よりもヒートローラのローラ面に帰属するようにしたことを特徴とする熱ローラ定着器。  
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【請求項2】 上記用紙分離爪は上記接触幅を有する2つの爪部を爪部間に所定の距離を設けて一体に形成した請求項1記載の熱ローラ定着器。

【請求項3】 上記用紙分離爪は上記接触幅を有する爪部を設けた個別の分離爪を爪部間に所定の距離を設けて複数隣接させた請求項1記載の熱ローラ定着器。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は電子写真プリンタ等の熱ローラ定着器に備えられた用紙分離爪に関する。

## 【0002】

【従来の技術】 従来、電子写真プリンタ等の熱ローラ定着器には、ヒートローラのローラ面に爪部を接触させた用紙分離爪を有し、ヒートローラとバックアップローラとの圧接部で未定着トナー画像を印刷用紙の紙面に加熱圧着し、ヒートローラ面に付着した印刷用紙を用紙分離爪でヒートローラ面から分離させるものがある。

## 【0003】

【発明が解決しようとする課題】 従来の熱ローラ定着器にあっては、印刷用紙をヒートローラ面から分離させる分離爪がスクリーパとなつて、ローラ面に付着した溶融した微小なオフセットトナー（以後トナーと記す）を分離爪の爪部とヒートローラ面との当接部に溜める。分離爪の爪部とヒートローラ面との当接部に溜まつた溶融したトナーはトナー量が少ない内は表面張力により分離爪の爪部に溜まつているが、トナー量が多くなつて、ヒートローラ面との接触面積が増大してくると、トナーとヒートローラ面との間に作用する摩擦力がトナーの表面張力に勝り、溶融したトナーがヒートローラ面に付着して印刷用紙を汚したり、あるいはバックアップローラの表面に付着して印刷用紙を汚したりするという問題点があつた。

【0004】 本発明は、微小なオフセットトナーが用紙分離爪とヒートローラ面との当接部に溜まらないようにして、印刷用紙がオフセットトナーにより汚されることから防止する熱ローラ定着器を提供することを目的としている。

## 【0005】

【課題を解決するための手段】 上記目的を達成するため本発明の熱ローラ定着器においては、用紙分離爪はヒートローラのローラ面との接触幅を1mm未満にしてヒートローラのローラ面に付着した微小なオフセットトナーが用紙分離爪よりもヒートローラのローラ面に帰属するようにしたものである。

## 【0006】

【作用】 上記のように構成された熱ローラ定着器のヒートローラを回転すると、ヒートローラ面に付着した溶融した微小なオフセットトナーは用紙分離爪の爪部に接触するが、1mm未満の接触幅を有するので用紙分離爪よりもヒートローラのローラ面に帰属したまま回転し、分離爪の爪部とヒートローラ面との当接部に溜まらないよう働く。

【0007】 従つて本発明よれば、微小なオフセットトナーが用紙分離爪とヒートローラ面との当接部で大きな固まりにならないので、印刷用紙がオフセットトナーにより汚されることから防止できるのである。

## 【0008】

20 【実施例】 本発明の実施例について図面を参照しながら説明する。尚、各図面に共通な要素には同一符号を付す。

【0009】 図1は熱ローラ定着器の概略構成を示す側面図であり、図2は実施例の分離爪を示す部分拡大図である。熱ローラ定着器1はヒートローラ2のローラ面に爪部を接触させた用紙分離爪3（以後分離爪3と記す）を有し、加熱されたヒートローラ2とバックアップローラ4との圧接部で未定着トナー画像を印刷用紙5の紙面に加熱圧着し、ヒートローラ2のローラ面に付着した印刷用紙5を用紙分離爪3でヒートローラ2のローラ面から分離させる。

【0010】 ヒートローラ2はアルミニウムやステンレス等の金属パイプからなり、未定着トナー画像に触れるので印刷用紙5の表面トナーに対して十分な剥離性を有するようにローラ表面にフッソ樹脂、あるいはシリコンゴム等の非粘着性を有する物質が被覆加工されている。ヒートローラ2の内部には図示せぬハロゲンランプ等の熱源が設けてある。また、バックアップローラ4は硬度の低いシリコンゴム等で構成されている。

40 【0011】 また、分離爪3は印刷できる許容用紙サイズに応じてヒートローラ2の軸方向に複数個配設され、定着器カバー6に回動自在に保持されて後端部を圧縮コイルスプリング7等に付勢され、爪部8をヒートローラ2の周面に適度な押圧力で当接させている。このため、分離爪3は機械的強度（高温で変形しにくい）や耐熱性に優れた液晶ポリマー、ポリイミドなどのプラスチックが基材として使用され、爪部8、あるいは全面にヒートローラ2のローラ面と同様非粘着性でヒートローラ2のローラ面を傷付けにくいフッソ樹脂などが被覆加工されている。

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【0012】ここで、分離爪3の爪部8とヒートローラ2のローラ面との接触幅Dがトナー付着にどのように影響するか実験した結果を下表に示す。（トナー粒子の大きさは7μ～9.5μである）

接触幅 (mm)	分離爪への付着	印刷用紙への転写
3.0	有り	有り
1.5	有り	有り
1.2	有り	有り
1.0	有り	殆ど無し
0.8	有り	無し
0.6	有り	無し

接触幅Dが1mm未満の場合には、爪部8の中央部のトナー同志の結合力よりヒートローラ2のローラ面への帰属力が強く、爪部8にわずかに付着するが、印刷用紙5を汚す程溜まらない。接触幅Dが1mm以上の場合は、爪部8の中央部のトナー同志の結合力がヒートローラ2のローラ面への帰属力より強く、爪部8に付着していき、溶融したトナーとヒートローラ2のローラ面との間に作用する摩擦力が溶融したトナーの表面張力に勝ると、一挙にヒートローラ2のローラ面に付着していくことが判る。

【0013】本実施例の分離爪3には、図2に示すように、ヒートローラ2のローラ面に接触する爪部8a、8bを爪部間に所定の距離Cを設けて2箇所有している。爪部8a、8bの接触幅Dは1mm未満である。

【0014】つぎに動作について説明する。加熱されたヒートローラ2とバックアップローラ4とはそれぞれ矢印A、B方向に回転し、圧接部で未定着トナー画像を印刷用紙5の紙面に加熱圧着する。非粘着性の物質で被覆加工されたヒートローラ2のローラ面には、定着時、溶融した微小なオフセットトナー（以後トナーと記す）が付着し、印刷用紙5に定着されるが目立たない程度微小である。そのような、微小なトナーが分離爪3の爪部8a、8bに接触するが、狭い接触幅Dを有するので分離爪3よりもヒートローラ2のローラ面に帰属したまま回転し、分離爪3の爪部8a、8bとヒートローラ2のローラ面との当接部に溜まらないように働く。

【0015】従って、微小なオフセットトナーが用紙分離爪とヒートローラ面との当接部で大きな固まりにならないので、印刷用紙がオフセットトナーにより汚されることから防止できるのである。

【0016】本発明に係る分離爪3の接触幅Dは1mm未満とし、本実施例の分離爪3の爪部8にはヒートローラ2のローラ面に接触する面を2箇所設けた（3箇所以

上にするとヒートローラ2のローラ面から浮いた爪部8が存在して、その先端部に印字用紙が引掛かり用紙ジャムの原因となる）が、図3に示すように、1mm未満の接触幅を有して接触する面を1箇所としてもよいし、図4に示すように、1mm未満の接触幅Dを有する個別の分離爪10a、10bを爪部間に所定の距離Cを設けて2箇隣接させた分離爪10としてもよいし、図5に示すように、個別の分離爪11a、11b、11cを複数隣接させた分離爪11としてもよい。個別の分離爪を複数隣接させることにより、ヒートローラのローラ面から浮いた爪部が存在しなくなり、用紙ジャムを防止できる。

#### 【0017】

【発明の効果】本発明は、以上説明したように構成されているので以下に記載される効果を奏する。

【0018】用紙分離爪とヒートローラのローラ面との接触幅を1mm未満にしたことにより、ローラ面上の微小なオフセットトナーが用紙分離爪により大きな固まりとはならないので、印刷用紙がオフセットトナーにより汚されない。

#### 【図面の簡単な説明】

【図1】熱ローラ定着器の概略構成を示す側面図である。

【図2】実施例の分離爪を示す部分拡大図である。

【図3】変形例の分離爪を示す部分拡大図(1)である。

【図4】変形例の分離爪を示す部分拡大図(2)である。

【図5】変形例の分離爪を示す部分拡大図(3)である。

#### 【符号の説明】

1 热ローラ定着器

2 ヒートローラ

3、9、10、11 用紙分離爪

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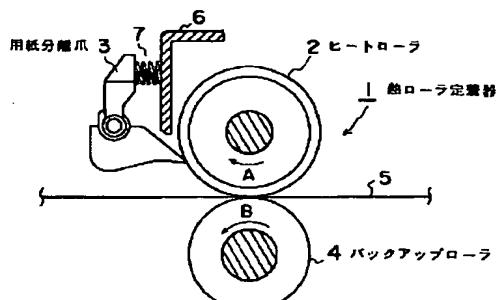
5

## 4 バックアップローラ

6

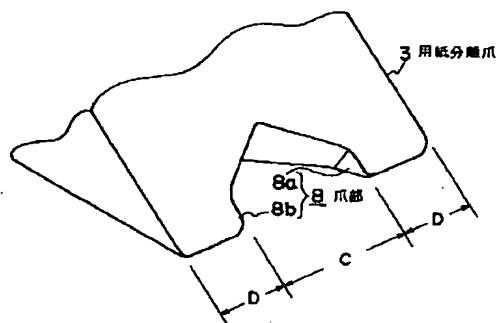
## 8 爪部

【図1】



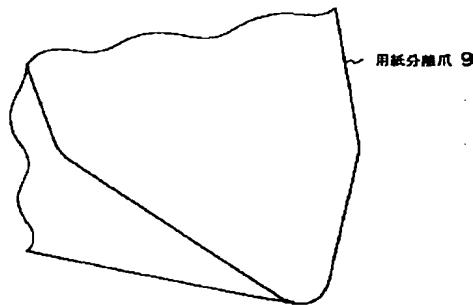
熱ローラ定着装置の構造構成を示す側面図

【図2】

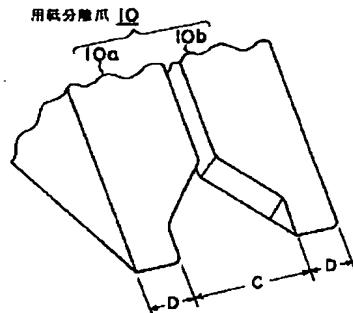


実施例の分離爪先端部を示す部分拡大図

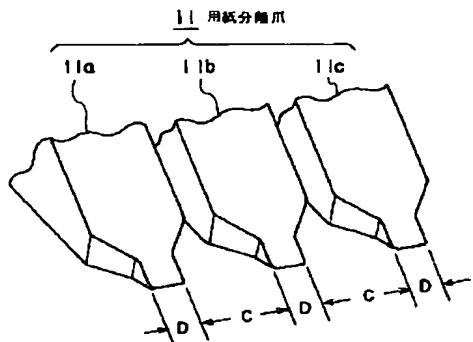
【図3】



【図4】



【図5】



## THERMAL ROLLER FIXING UNIT

Patent Number: JP8314318

Publication date: 1996-11-29

Inventor(s): ITAYA TAKASHI; YAJIMA HIROYUKI

Applicant(s): OKI DATA:KK

Requested Patent:  JP8314318

Application Number: JP19950121047 19950519

Priority Number(s):

IPC Classification: G03G15/20; B65H29/54

EC Classification:

Equivalents:

### Abstract

**PURPOSE:** To prevent the retaining of a very little offset toner in the abutting part of a paper peeling pawl against a heating roller surface, for preventing the staining of a printing paper with the offset toner by constituting a thermal roller fixing unit so that the contact width of the paper separating pawl with the roller surface of the heating roller is set to be a specific value and a very little offset toner stuck to the roller surface belongs to not the paper separating pawl but the roller surface.

**CONSTITUTION:** The contact width of the paper separating pawl 3 with the roller surface of the heating roller 2 is set <1mm, so that a very little offset toner stuck to the roller surface of the heating roller 2 belongs to not the separating pawl 3 but the roller surface of the heating roller 2. When the heating roller 2 of the thermal roller fixing unit 1 is rotated, a very little offset toner stuck/melted on the surface of the heating roller 2 comes into contact with the pawl part of the separating pawl 3. However, <1mm contact width is set so that the heating roller 2 is rotated in a state where a very little offset toner belongs to not the separating pawl 3 but the roller surface of the heating roller 2. Thus, a very little offset toner is not retained in the abutting part of the pawl part of the separating pawl 3 on the surface of the heating roller 2.

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# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-314318  
 (43)Date of publication of application : 29.11.1996

(51)Int.CI. G03G 15/20  
 B65H 29/54

(21)Application number : 07-121047

(71)Applicant : OKI DATA:KK

(22)Date of filing : 19.05.1995

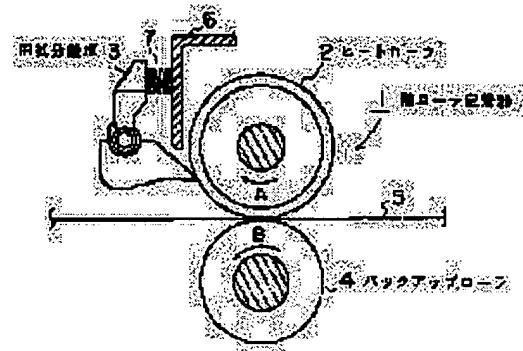
(72)Inventor : ITAYA TAKASHI  
 YAJIMA HIROYUKI

## (54) THERMAL ROLLER FIXING UNIT

### (57)Abstract:

**PURPOSE:** To prevent the retaining of a very little offset toner in the abutting part of a paper peeling pawl against a heating roller surface, for preventing the staining of a printing paper with the offset toner by constituting a thermal roller fixing unit so that the contact width of the paper separating pawl with the roller surface of the heating roller is set to be a specific value and a very little offset toner stuck to the roller surface belongs to not the paper separating pawl but the roller surface.

**CONSTITUTION:** The contact width of the paper separating pawl 3 with the roller surface of the heating roller 2 is set <1mm, so that a very little offset toner stuck to the roller surface of the heating roller 2 belongs to not the separating pawl 3 but the roller surface of the heating roller 2. When the heating roller 2 of the thermal roller fixing unit 1 is rotated, a very little offset toner stuck/melted on the surface of the heating roller 2 comes into contact with the pawl part of the separating pawl 3. However, <1mm contact width is set so that the heating roller 2 is rotated in a state where a very little offset toner belongs to not the separating pawl 3 but the roller surface of the heating roller 2. Thus, a very little offset toner is not retained in the abutting part of the pawl part of the separating pawl 3 on the surface of the heating roller 2.



### LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

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**CLAIMS****[Claim(s)]**

[Claim 1] Have a deleaving pawl which contacted a claw part to a roller side of a heating roller, and heating sticking by pressure of the non-established toner image is carried out in the pressure-welding section of a heating roller and a backup roller at space of a print sheet. In a heat roller fixing assembly into which a print sheet adhering to a heating roller side is made to separate from a heating roller side by deleaving pawl The above-mentioned deleaving pawl is a heat roller fixing assembly characterized by making it a minute offset toner which set contact width of face with a roller side of a heating roller to less than 1mm, and adhered to a roller side of a heating roller belong to a roller side of a heating roller rather than a deleaving pawl.

[Claim 2] The above-mentioned deleaving pawl is the heat roller fixing assembly according to claim 1 which established a predetermined distance between claw parts and formed in one two claw parts which have the above-mentioned contact width of face.

[Claim 3] The above-mentioned deleaving pawl is the heat roller fixing assembly according to claim 1 which a predetermined distance was established [fixing assembly] between claw parts and carried out two or more contiguity of the separation pawl according to individual which prepared a claw part which has the above-mentioned contact width of face.

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[Translation done.]

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**DETAILED DESCRIPTION****[Detailed Description of the Invention]**

[0001]

[Industrial Application] This invention relates to the deleaving pawl with which heat roller fixing assemblys, such as an electro photographic printer, were equipped.

[0002]

[Description of the Prior Art] Conventionally, it has the deleaving pawl which contacted the claw part to the roller side of a heating roller, heating sticking by pressure of the non-established toner image is carried out in the pressure-welding section of a heating roller and a backup roller at the space of a print sheet, and there is a thing into which the print sheet adhering to a heating roller side is made to separate from a heating roller side by the deleaving pawl in heat roller fixing assemblys, such as an electro photographic printer.

[0003]

[Problem(s) to be Solved by the Invention] If it is in the conventional heat roller fixing assembly, the separation pawl into which a print sheet is made to separate from a heating roller side serves as a scraper, and the fused minute offset toner (it is henceforth described as a toner) adhering to a roller side is accumulated in the contact section of the claw part of a separation pawl, and a heating roller side. Although it has collected on the claw part of a separation pawl with surface tension while the fused toner collected on the contact section of the claw part of a separation pawl and a heating roller side has few amounts of toners If the amount of toners increases and a touch area with a heating roller side increases There was a trouble of soiling a print sheet, or the toner which the frictional force which acts between a toner and a heating roller side excelled the surface tension of a toner, and fused having adhered to a heating roller side, having adhered on the surface of a backup roller, and soiling a print sheet.

[0004] This invention aims at offering the heat roller fixing assembly prevented from a print sheet being soiled with an offset toner, as a minute offset toner does not collect on the contact section of a deleaving pawl and a heating roller side.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, it is made for a minute offset toner which a deleaving pawl set contact width of face with a roller side of a heating roller to less than 1mm, and adhered to a roller side of a heating roller to belong to a roller side of a heating roller rather than a deleaving pawl in a heat roller fixing assembly of this invention.

[0006]

[Function] Although the fused minute offset toner adhering to a heating roller side contacts the claw part of a deleaving pawl, it will rotate belonged to the roller side of a heating roller rather than a deleaving pawl, since it had contact width of face of less than 1mm, and if the heating roller of the heat roller fixing assembly constituted as mentioned above is rotated, it will work so that it may not collect on the contact section of the claw part of a separation pawl, and a heating roller side.

[0007] Therefore, since this invention \*\*\*\*\* and a minute offset toner do not become a big lump in the contact section of a deleaving pawl and a heating roller side, a print sheet can prevent from being soiled with an offset toner.

[0008]

[Example] It explains referring to a drawing about the example of this invention. In addition, the same sign is given to an element common to each drawing.

[0009] Drawing 1 is the side elevation showing the outline configuration of a heat roller fixing assembly, and drawing 2 is the partial enlarged view showing the separation pawl of an example. The heat roller fixing assembly 1 has the deleaving pawl 3 (it is henceforth described as the separation pawl 3) which contacted the claw part to the roller side of

a heating roller 2, carries out heating sticking by pressure of the non-established toner image at the space of a print sheet 5 in the pressure-welding section of the heating roller 2 and backup roller 4 which were heated, and makes the deleaving pawl 3 separate the print sheet 5 adhering to the roller side of a heating roller 2 from the roller side of a heating roller 2. [0010] A heating roller 2 consists of metallic pipes, such as aluminum and stainless steel, and since a non-established toner image is touched, coating of the material which has non-adhesiveness, such as fluorine resin or silicone rubber, on the roller surface so that it may have sufficient detachability to the surface toner of a print sheet 5 is carried out. The heat source of the halogen lamp which is not illustrated is prepared in the interior of a heating roller 2. Moreover, the backup roller 4 consists of silicone rubber with a low degree of hardness etc.

[0011] Moreover, two or more separation pawls 3 are arranged by the shaft orientations of a heating roller 2 according to the permission paper size which can be printed, they are held free [ rotation to the fixing assembly covering 6 ], and compression coil spring 7 grade energizes the back end section, and they are making the claw part 8 contact the peripheral surface of a heating roller 2 by moderate thrust. For this reason, plastics, such as a liquid crystal polymer the separation pawl 3 excelled [ liquid crystal polymer ] in a mechanical strength (it is hard to deform at an elevated temperature) or thermal resistance, and polyimide, is used as a base material, and coating of the fluorine resin which cannot damage the roller side of a heating roller 2 as well as the roller side of a heating roller 2 easily due to non-adhesiveness all over a claw part 8 is carried out.

[0012] Here, how the contact width of face D of the claw part 8 of the separation pawl 3 and the roller side of a heating roller 2 influencing toner adhesion and the result in which it experimented are shown in the following table. (The magnitude of a toner particle is 7micro-9.5micro)

接触幅 (mm)	分離爪への付着	印刷用紙への転写
3. 0	有り	有り
1. 5	有り	有り
1. 2	有り	有り
1. 0	有り	殆ど無し
0. 8	有り	無し
0. 6	有り	無し

When the contact width of face D is less than 1mm, from the bonding strength of the toner comrade of the center section of the claw part 8, the imputed force to the roller side of a heating roller 2 is strong, and it adheres to a claw part 8 slightly, but it does not collect, so that a print sheet 5 is soiled. When the contact width of face D is 1mm or more, the bonding strength of the toner comrade of the center section of the claw part 8 is stronger than the imputed force to the roller side of a heating roller 2, and it adheres to the claw part 8, and when the surface tension of the toner which the frictional force which acts between the toners and the roller sides of a heating roller 2 which were fused fused is excelled, it turns out that it adheres at once in the roller side of a heating roller 2.

[0013] On the separation pawl 3 of this example, as shown in drawing 2, the predetermined distance C is established between claw parts, and it has two claw parts 8a and 8b in contact with the roller side of a heating roller 2. The contact width of face D of claw parts 8a and 8b is less than 1mm.

[0014] Actuation is explained below. The heating roller 2 and backup roller 4 which were heated rotate in an arrow head A and the direction of B, respectively, and carry out heating sticking by pressure of the non-established toner image in the pressure-welding section at the space of a print sheet 5. the degree which is not conspicuous although the fused minute offset toner (it is henceforth described as a toner) adheres to the roller side of the heating roller 2 by which coating was carried out by the material of non-adhesiveness at the time of fixing and a print sheet 5 is established -- it is minute. Although such a minute toner contacts the claw parts 8a and 8b of the separation pawl 3, it rotates belonged to the roller side of a heating roller 2 rather than the separation pawl 3, since it had the narrow contact width of face D, and

it works so that it may not collect on the contact section of the claw parts 8a and 8b of the separation pawl 3, and the roller side of a heating roller 2.

[0015] Therefore, since a minute offset toner does not become a big lump in the contact section of a deleaving pawl and a heating roller side, a print sheet can prevent from being soiled with an offset toner.

[0016] Contact width of face D of the separation pawl 3 concerning this invention was set to less than 1mm, and the field in contact with the roller side of a heating roller 2 was established in the claw part 8 of the separation pawl 3 of this example two places (the claw part 8 which floated from the roller side of a heating roller 2 when it was made three or more places exists). the point -- a print form -- being caught -- the cause of a paper jam -- becoming, as shown in drawing 3. As it is good also as one place and the field which has contact width of face of less than 1mm, and contacts is shown in drawing 4. It is good also as a separation pawl 10 which the predetermined distance C was established [ pawl ] and made two separation pawls 10a and 10b according to individual which has contact width of face D of less than 1mm adjoin between claw parts, and as shown in drawing 5, it is good also as a separation pawl 11 which carried out two or more contiguity of the separation pawls 11a, 11b, and 11c according to individual. By having carried out two or more contiguity of the separation pawl according to individual, the claw part which floated from the roller side of a heating roller stops existing, and a paper jam can be prevented.

[0017]

[Effect of the Invention] Since this invention is constituted as explained above, it does so the effect indicated below.

[0018] Since, as for a big lump, the minute offset toner on a roller side does not become with a deleaving pawl by having set contact width of face of a deleaving pawl and the roller side of a heating roller to less than 1mm, a print sheet is not soiled with an offset toner.

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[Translation done.]

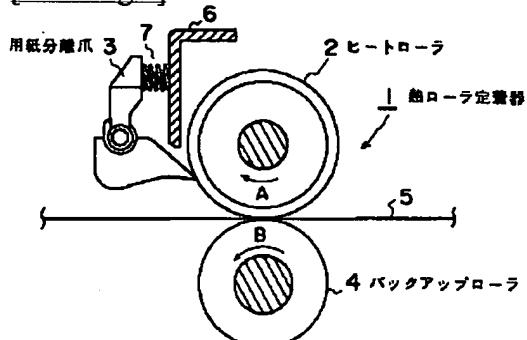
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2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

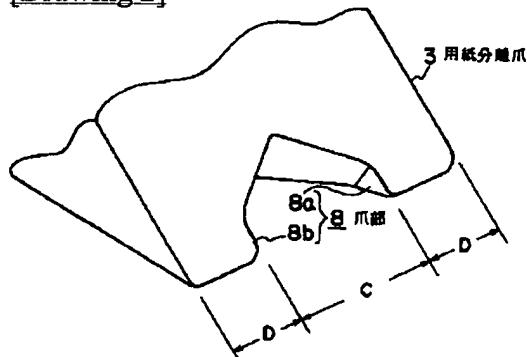
## DRAWINGS

## [Drawing 1]



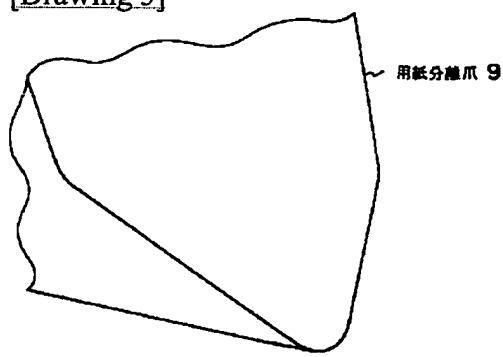
熱ローラ定着装置の概略構成を示す側面図

## [Drawing 2]

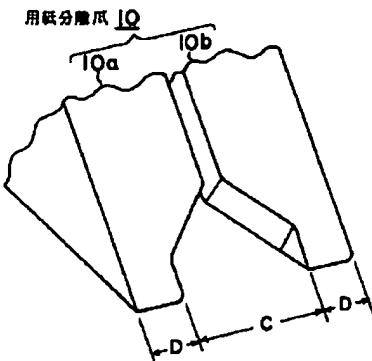


実施例の分離爪先端部を示す部分拡大図

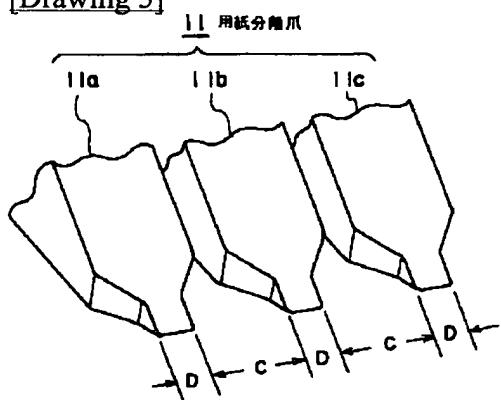
## [Drawing 3]



## [Drawing 4]



[Drawing 5]



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[Translation done.]